Release notes for ENDF/B Development n-092_U_238 evaluation

April 26, 2017

- `checkr` Errors:

  1. This file is missing a required covariance section
     MAT=9237, MF=33, MT= 18 (0): Missing covariance

```
ERROR(S) FOUND IN MAT=9237, MF=33, MT= 18
   REQUIRED COVARIANCE SECTION 33/102 MISSING       RECORD NUMBER  131769
```

- `fizcon` Errors:

  1. The cross section and an outgoing distribution don't span the same energy region.
     MAT=9237, MF=35, MT= 18 (1): Diff limits (a)

```
ERROR(S) FOUND IN MAT=9237, MF=35, MT= 18
   SECTION DOES NOT SPAN THE SAME ENERGY RANGE AS FILE   5, MT=  18
```

- `psyche` Warnings:

  1. Gamma width not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ISOTOPE MASS = 238. L = 1 / AT RESONANCE ENERGY 8.08138E+02 EV. THE GAMMA WIDTH 2.25000E+00 DEVIATES TOO MUCH FROM THE AVERAGE 2.41465E-02 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 238. L =  1
                 AT RESONANCE ENERGY  8.08138E+02 EV. THE GAMMA WIDTH  2.25000E+00 DEVIATES TOO MUCH FROM THE AV
```

  2. Gamma width not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ISOTOPE MASS = 238. L = 1 / AT RESONANCE ENERGY 1.08410E+04 EV. THE GAMMA WIDTH 3.96774E-03 DEVIATES TOO MUCH FROM THE AVERAGE 2.41465E-02 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 238. L =  1
                 AT RESONANCE ENERGY  1.08410E+04 EV. THE GAMMA WIDTH  3.96774E-03 DEVIATES TOO MUCH FROM THE AV
```

  3. Gamma width not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ISOTOPE MASS = 238. L = 1 / AT RESONANCE ENERGY 1.11751E+04 EV. THE GAMMA WIDTH 7.34642E-03 DEVIATES TOO MUCH FROM THE AVERAGE 2.41465E-02 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 238. L =  1
                 AT RESONANCE ENERGY  1.11751E+04 EV. THE GAMMA WIDTH  7.34642E-03 DEVIATES TOO MUCH FROM THE AV
```

  4. Gamma width not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ISOTOPE MASS = 238. L = 1 / AT RESONANCE ENERGY 1.13195E+04 EV. THE GAMMA WIDTH 7.77398E-03 DEVIATES TOO MUCH FROM THE AVERAGE 2.41465E-02 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 238. L =  1
                 AT RESONANCE ENERGY  1.13195E+04 EV. THE GAMMA WIDTH  7.77398E-03 DEVIATES TOO MUCH FROM THE AV
```

5. Gamma width not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ISOTOPE MASS = 238. L = 1 / AT RESONANCE ENERGY 1.22845E+04 EV. THE GAMMA WIDTH 5.45270E-03 DEVIATES TOO MUCH FROM THE AVERAGE 2.41465E-02 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 238. L =  1
                 AT RESONANCE ENERGY  1.22845E+04 EV. THE GAMMA WIDTH  5.45270E-03 DEVIATES TOO MUCH FROM THE AV
```

6. Gamma width not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ISOTOPE MASS = 238. L = 1 / AT RESONANCE ENERGY 1.35537E+04 EV. THE GAMMA WIDTH 9.33115E-02 DEVIATES TOO MUCH FROM THE AVERAGE 2.41465E-02 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 238. L =  1
                 AT RESONANCE ENERGY  1.35537E+04 EV. THE GAMMA WIDTH  9.33115E-02 DEVIATES TOO MUCH FROM THE AV
```

7. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.00000E+04. STRENGTH FUNCTION IS 1.66254E-04 / ENERGY = 2.00000E+04. STRENGTH FUNCTION IS 1.66254E-04 / DENSITY 1.08440E+01 SHOULD BE 1.05977E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  2.00000E+04. STRENGTH FUNCTION IS  1.66254E-04
                  ENERGY =  2.00000E+04. STRENGTH FUNCTION IS  1.66254E-04
                                DENSITY  1.08440E+01 SHOULD BE  1.05977E+01
```

8. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.05000E+04. STRENGTH FUNCTION IS 1.66295E-04 / DENSITY 1.08314E+01 SHOULD BE 1.05854E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
           ENERGY =  2.05000E+04. STRENGTH FUNCTION IS  1.66295E-04
                        DENSITY  1.08314E+01 SHOULD BE  1.05854E+01
```

9. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.12500E+04. STRENGTH FUNCTION IS 1.66355E-04 / DENSITY 1.08126E+01 SHOULD BE 1.05671E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
           ENERGY =  2.12500E+04. STRENGTH FUNCTION IS  1.66355E-04
                        DENSITY  1.08126E+01 SHOULD BE  1.05671E+01
```

10. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.20000E+04. STRENGTH FUNCTION IS 1.66414E-04 / DENSITY 1.07939E+01 SHOULD BE 1.05488E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.20000E+04. STRENGTH FUNCTION IS  1.66414E-04
                         DENSITY  1.07939E+01 SHOULD BE  1.05488E+01
```

11. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.30000E+04. STRENGTH FUNCTION IS 1.66491E-04 / DENSITY 1.07689E+01 SHOULD BE 1.05244E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.30000E+04. STRENGTH FUNCTION IS  1.66491E-04
                         DENSITY  1.07689E+01 SHOULD BE  1.05244E+01
```

12. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.37500E+04. STRENGTH FUNCTION IS 1.66547E-04 / DENSITY 1.07502E+01 SHOULD BE 1.05062E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.37500E+04. STRENGTH FUNCTION IS  1.66547E-04
                         DENSITY  1.07502E+01 SHOULD BE  1.05062E+01
```

13. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.40000E+04. STRENGTH FUNCTION IS 1.66566E-04 / DENSITY 1.07440E+01 SHOULD BE 1.05001E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.40000E+04. STRENGTH FUNCTION IS  1.66566E-04
                         DENSITY  1.07440E+01 SHOULD BE  1.05001E+01
```

14. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.50000E+04. STRENGTH FUNCTION IS 1.66639E-04 / DENSITY 1.07192E+01 SHOULD BE 1.04759E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.50000E+04. STRENGTH FUNCTION IS  1.66639E-04
                         DENSITY  1.07192E+01 SHOULD BE  1.04759E+01
```

15. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.60000E+04. STRENGTH FUNCTION IS 1.66710E-04 / DENSITY 1.06944E+01 SHOULD BE 1.04517E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.60000E+04. STRENGTH FUNCTION IS  1.66710E-04
                         DENSITY  1.06944E+01 SHOULD BE  1.04517E+01
```

16. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.62500E+04. STRENGTH FUNCTION IS 1.66728E-04 / DENSITY 1.06882E+01 SHOULD BE 1.04456E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.62500E+04. STRENGTH FUNCTION IS  1.66728E-04
                         DENSITY  1.06882E+01 SHOULD BE  1.04456E+01
```

17. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.70000E+04. STRENGTH FUNCTION IS 1.66780E-04 / DENSITY 1.06697E+01 SHOULD BE 1.04275E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.70000E+04. STRENGTH FUNCTION IS  1.66780E-04
                         DENSITY  1.06697E+01 SHOULD BE  1.04275E+01
```

18. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.80000E+04. STRENGTH FUNCTION IS 1.66848E-04 / DENSITY 1.06450E+01 SHOULD BE 1.04035E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.80000E+04. STRENGTH FUNCTION IS  1.66848E-04
                         DENSITY  1.06450E+01 SHOULD BE  1.04035E+01
```

19. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.87500E+04. STRENGTH FUNCTION IS 1.66898E-04 / DENSITY 1.06265E+01 SHOULD BE 1.03854E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.87500E+04. STRENGTH FUNCTION IS  1.66898E-04
                         DENSITY  1.06265E+01 SHOULD BE  1.03854E+01
```

20. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.00000E+04. STRENGTH FUNCTION IS 1.66979E-04 / DENSITY 1.05958E+01 SHOULD BE 1.03555E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.00000E+04. STRENGTH FUNCTION IS  1.66979E-04
                         DENSITY  1.05958E+01 SHOULD BE  1.03555E+01
```

21. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.10000E+04. STRENGTH FUNCTION IS 1.67042E-04 / DENSITY 1.05714E+01 SHOULD BE 1.03316E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.10000E+04. STRENGTH FUNCTION IS  1.67042E-04
                         DENSITY  1.05714E+01 SHOULD BE  1.03316E+01
```

22. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.25000E+04. STRENGTH FUNCTION IS 1.67133E-04 / DENSITY 1.05347E+01 SHOULD BE 1.02958E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.25000E+04. STRENGTH FUNCTION IS  1.67133E-04
                         DENSITY  1.05347E+01 SHOULD BE  1.02958E+01
```

23. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.40000E+04. STRENGTH FUNCTION IS 1.67222E-04 / DENSITY 1.04982E+01 SHOULD BE 1.02602E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.40000E+04. STRENGTH FUNCTION IS  1.67222E-04
                         DENSITY  1.04982E+01 SHOULD BE  1.02602E+01
```

24. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.50000E+04. STRENGTH FUNCTION IS 1.67279E-04 / DENSITY 1.04740E+01 SHOULD BE 1.02365E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.50000E+04. STRENGTH FUNCTION IS  1.67279E-04
                         DENSITY  1.04740E+01 SHOULD BE  1.02365E+01
```

25. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.62500E+04. STRENGTH FUNCTION IS 1.67348E-04 / DENSITY 1.04438E+01 SHOULD BE 1.02070E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.62500E+04. STRENGTH FUNCTION IS  1.67348E-04
                         DENSITY  1.04438E+01 SHOULD BE  1.02070E+01
```

26. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.75000E+04. STRENGTH FUNCTION IS 1.67415E-04 / DENSITY 1.04136E+01 SHOULD BE 1.01776E+01 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.75000E+04. STRENGTH FUNCTION IS  1.67415E-04
                         DENSITY  1.04136E+01 SHOULD BE  1.01776E+01
```

27. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / TOTAL OF 83 POINTS IN ERROR FOR THIS J-STATE (0): URR dens. (b)

```
FILE  2
   SECTION 151
            TOTAL OF    83 POINTS IN ERROR FOR THIS J-STATE
            TOTAL OF    83 POINTS IN ERROR FOR THIS J-STATE
```

28. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.00000E+04. STRENGTH FUNCTION IS 1.37178E-04 / ENERGY = 2.00000E+04. STRENGTH FUNCTION IS 1.37178E-04 / DENSITY 7.51148E+00 SHOULD BE 7.22931E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  2.00000E+04. STRENGTH FUNCTION IS  1.37178E-04
                   ENERGY =  2.00000E+04. STRENGTH FUNCTION IS  1.37178E-04
                                     DENSITY  7.51148E+00 SHOULD BE  7.22931E+00
```

29. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.05000E+04. STRENGTH FUNCTION IS 1.37168E-04 / DENSITY 7.50277E+00 SHOULD BE 7.22095E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.05000E+04. STRENGTH FUNCTION IS  1.37168E-04
                                DENSITY  7.50277E+00 SHOULD BE  7.22095E+00
```

30. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.12500E+04. STRENGTH FUNCTION IS 1.37154E-04 / DENSITY 7.48973E+00 SHOULD BE 7.20842E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.12500E+04. STRENGTH FUNCTION IS  1.37154E-04
                                DENSITY  7.48973E+00 SHOULD BE  7.20842E+00
```

31. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.20000E+04. STRENGTH FUNCTION IS 1.37140E-04 / DENSITY 7.47670E+00 SHOULD BE 7.19591E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.20000E+04. STRENGTH FUNCTION IS  1.37140E-04
                                DENSITY  7.47670E+00 SHOULD BE  7.19591E+00
```

32. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.30000E+04. STRENGTH FUNCTION IS 1.37121E-04 / DENSITY 7.45938E+00 SHOULD BE 7.17927E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.30000E+04. STRENGTH FUNCTION IS  1.37121E-04
                                DENSITY  7.45938E+00 SHOULD BE  7.17927E+00
```

33. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.37500E+04. STRENGTH FUNCTION IS 1.37106E-04 / DENSITY 7.44641E+00 SHOULD BE 7.16681E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.37500E+04. STRENGTH FUNCTION IS  1.37106E-04
                                DENSITY  7.44641E+00 SHOULD BE  7.16681E+00
```

34. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.40000E+04. STRENGTH FUNCTION IS 1.37101E-04 / DENSITY 7.44209E+00 SHOULD BE 7.16267E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.40000E+04. STRENGTH FUNCTION IS  1.37101E-04
                         DENSITY  7.44209E+00 SHOULD BE  7.16267E+00
```

35. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.50000E+04. STRENGTH FUNCTION IS 1.37082E-04 / DENSITY 7.42485E+00 SHOULD BE 7.14611E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.50000E+04. STRENGTH FUNCTION IS  1.37082E-04
                         DENSITY  7.42485E+00 SHOULD BE  7.14611E+00
```

36. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.60000E+04. STRENGTH FUNCTION IS 1.37063E-04 / DENSITY 7.40765E+00 SHOULD BE 7.12958E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.60000E+04. STRENGTH FUNCTION IS  1.37063E-04
                         DENSITY  7.40765E+00 SHOULD BE  7.12958E+00
```

37. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.62500E+04. STRENGTH FUNCTION IS 1.37058E-04 / DENSITY 7.40336E+00 SHOULD BE 7.12546E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.62500E+04. STRENGTH FUNCTION IS  1.37058E-04
                         DENSITY  7.40336E+00 SHOULD BE  7.12546E+00
```

38. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.70000E+04. STRENGTH FUNCTION IS 1.37044E-04 / DENSITY 7.39049E+00 SHOULD BE 7.11310E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.70000E+04. STRENGTH FUNCTION IS  1.37044E-04
                         DENSITY  7.39049E+00 SHOULD BE  7.11310E+00
```

39. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.80000E+04. STRENGTH FUNCTION IS 1.37025E-04 / DENSITY 7.37337E+00 SHOULD BE 7.09665E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.80000E+04. STRENGTH FUNCTION IS  1.37025E-04
                         DENSITY  7.37337E+00 SHOULD BE  7.09665E+00
```

40. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.87500E+04. STRENGTH FUNCTION IS 1.37010E-04 / DENSITY 7.36056E+00 SHOULD BE 7.08435E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.87500E+04. STRENGTH FUNCTION IS  1.37010E-04
                         DENSITY  7.36056E+00 SHOULD BE  7.08435E+00
```

41. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.00000E+04. STRENGTH FUNCTION IS 1.36986E-04 / DENSITY 7.33926E+00 SHOULD BE 7.06389E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.00000E+04. STRENGTH FUNCTION IS  1.36986E-04
                         DENSITY  7.33926E+00 SHOULD BE  7.06389E+00
```

42. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.10000E+04. STRENGTH FUNCTION IS 1.36967E-04 / DENSITY 7.32227E+00 SHOULD BE 7.04757E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.10000E+04. STRENGTH FUNCTION IS  1.36967E-04
                         DENSITY  7.32227E+00 SHOULD BE  7.04757E+00
```

43. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.25000E+04. STRENGTH FUNCTION IS 1.36938E-04 / DENSITY 7.29685E+00 SHOULD BE 7.02315E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.25000E+04. STRENGTH FUNCTION IS  1.36938E-04
                         DENSITY  7.29685E+00 SHOULD BE  7.02315E+00
```

44. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.40000E+04. STRENGTH FUNCTION IS 1.36909E-04 / DENSITY 7.27153E+00 SHOULD BE 6.99883E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.40000E+04. STRENGTH FUNCTION IS  1.36909E-04
                         DENSITY  7.27153E+00 SHOULD BE  6.99883E+00
```

45. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.50000E+04. STRENGTH FUNCTION IS 1.36890E-04 / DENSITY 7.25470E+00 SHOULD BE 6.98266E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.50000E+04. STRENGTH FUNCTION IS  1.36890E-04
                         DENSITY  7.25470E+00 SHOULD BE  6.98266E+00
```

46. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.62500E+04. STRENGTH FUNCTION IS 1.36865E-04 / DENSITY 7.23372E+00 SHOULD BE 6.96250E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.62500E+04. STRENGTH FUNCTION IS  1.36865E-04
                         DENSITY  7.23372E+00 SHOULD BE  6.96250E+00
```

47. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.75000E+04. STRENGTH FUNCTION IS 1.36841E-04 / DENSITY 7.21280E+00 SHOULD BE 6.94241E+00 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.75000E+04. STRENGTH FUNCTION IS  1.36841E-04
                         DENSITY  7.21280E+00 SHOULD BE  6.94241E+00
```

48. Non-threshold reaction with Q value differing from PSYCHE's expectations
FILE 3 / SECTION 112 / THE CALCULATED Q 5.13127E+05 DISSAGREES WITH THE GIVEN Q 5.58000E+05 (0): Iffy Q

```
FILE  3
   SECTION 112
            THE CALCULATED Q  5.13127E+05 DISSAGREES WITH THE GIVEN Q  5.58000E+05
```

- `psyche` Errors:

1. A probability distribution is negative. This is bad.
FILE 6 / SECTION 5 / DISTRIBUTION IS NEGATIVE SEQUENCE NUMBER 67 (0): Neg. prob.

```
FILE  6
   SECTION   5
        DISTRIBUTION IS NEGATIVE                        SEQUENCE NUMBER    67
                 ENERGY BALANCE SUMMARY: Q =   8.51900E+06         ENERGY BALANCE SUMMARY: Q =   8.51900E+06
                 ENERGY BALANCE SUMMARY: Q =  -9.96994E+06         ENERGY BALANCE SUMMARY: Q =  -9.96994E+06
... [3 more lines]
```

2. A probability distribution is negative. This is bad.
FILE 6 / SECTION 5 / DISTRIBUTION IS NEGATIVE SEQUENCE NUMBER 67 / ENERGY BALANCE SUMMARY: Q = 4.27000E+06 (0): Neg. prob.

```
FILE  6
   SECTION   5
        DISTRIBUTION IS NEGATIVE                        SEQUENCE NUMBER    67
                 ENERGY BALANCE SUMMARY: Q =   4.27000E+06
```

- `groupie` Errors:

1. Very small elastic cross section found
0: Small elastic

```
 Multi-Group and Multi-Band Parameters from ENDF/B Data (GROUPIE 2015-2)
 -----------------------------------------------------------------------------
 ENDF/B Input and Output Data Filenames
 ENDFB.IN
 ENDFB.OUT
... [97 more lines]
```

- `fudge-4.0` Warnings:

  1. Missing a channel with a particular angular momenta combination
     resonances / resolved (Error # 1): missingResonanceChannel

     ```
     WARNING: Missing a channel with angular momenta combination L = 1, J = 1.5 and S = 0.5 for "competitive"
     WARNING: Missing a channel with angular momenta combination L = 2, J = 1.5 and S = 0.5 for "competitive"
     WARNING: Missing a channel with angular momenta combination L = 2, J = 2.5 and S = 0.5 for "competitive"
     ```

  2. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: total (Error # 0): CS Sum.

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 1.32%
     ```

  3. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 1: (z,n) (Error # 0): CS Sum.

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.50%
     ```

  4. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 2 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + photon [total fission]): / Form 'eval': / Component 0 (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     WARNING: Ratio of smallest/largest eigenvalue (1.749610e-12) is too small
     ```

  5. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 2 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + photon [total fission]): / Form 'eval': / Component 1 (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     ```

  6. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 2 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + photon [total fission]): / Form 'eval': / Component 2 (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     ```

  7. The on-diagonal elements of a covariance (the varience...) were very big.
     Section 2 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + photon [total fission]): / Form 'eval': / Component 3 (Error # 0): Large variance

     ```
     WARNING: Encountered very large variance (1.687508e+02%) at index 530.
     ```

  8. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 4 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + photon [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (4.108877e-19) is too small
```

- `fudge-4.0` Errors:

  1. Level energy in gamma data doesn't match level energy in cross section data
     Reading ENDF file: ../n-092_U_238.endf (Error # 0): Level mismatch (d)

     ```
     WARNING: MT54 MF12 level energy 518100.1 differs from MF3 value 518100.2. Setting to MF3 value.
     ```

  2. Level energy in gamma data doesn't match level energy in cross section data
     Reading ENDF file: ../n-092_U_238.endf (Error # 1): Level mismatch (d)

     ```
     WARNING: MT55 MF12 level energy 680110.1 differs from MF3 value 680110.2. Setting to MF3 value.
     ```

  3. Level energy in gamma data doesn't match level energy in cross section data
     Reading ENDF file: ../n-092_U_238.endf (Error # 2): Level mismatch (d)

     ```
     WARNING: MT56 MF12 level energy 731930.1 differs from MF3 value 731930.2. Setting to MF3 value.
     ```

  4. Level energy in gamma data doesn't match level energy in cross section data
     Reading ENDF file: ../n-092_U_238.endf (Error # 3): Level mismatch (d)

     ```
     WARNING: MT58 MF12 level energy 826640.1 differs from MF3 value 826640.2. Setting to MF3 value.
     ```

  5. Level energy in gamma data doesn't match level energy in cross section data
     Reading ENDF file: ../n-092_U_238.endf (Error # 4): Level mismatch (d)

     ```
     WARNING: MT61 MF12 level energy 950120.1 differs from MF3 value 950120.3. Setting to MF3 value.
     ```

  6. Level energy in gamma data doesn't match level energy in cross section data
     Reading ENDF file: ../n-092_U_238.endf (Error # 5): Level mismatch (d)

     ```
     WARNING: MT65 MF12 level energy 997580.1 differs from MF3 value 997580.2. Setting to MF3 value.
     ```

  7. The spin statistical weights are off, indicating missing channels
     resonances / resolved / Reich_Moore (Error # 0): badSpinStatisticalWeights

     ```
     WARNING: The spin statical weights for L=1 sums to 1.0, but should sum to 3.0.  You have too few channels for re
     WARNING: The spin statical weights for L=1 sums to 1.0, but should sum to 3.0.  You have too few channels for re
     ```

  8. Energy range of data set does not match cross section range
     reaction label 6: n + U238_e6 / Product: n / Distribution: / angularTwoBody - XYs2d: (Error # 0): Domain mismatch (a)

     ```
     WARNING: Domain doesn't match the cross section domain: (735031.4 -> 30000000.0) vs (735031.5 -> 30000000.0)
     ```

  9. Energy range of data set does not match cross section range
     reaction label 9: n + U238_e9 / Product: n / Distribution: / angularTwoBody - XYs2d: (Error # 0): Domain mismatch (a)

     ```
     WARNING: Domain doesn't match the cross section domain: (931138.9 -> 30000000.0) vs (931139.0 -> 30000000.0)
     ```

  10. If an outgoing energy distribution ends with more than one energy with probability=0, proper unitbase treatment is unclear. Distribution should end with exactly one P=0 point.
      reaction label 40: n + (U238_c -> U238 + photon) / Product: n / Distribution: / energyAngular - XYs3d: (Error # 0): extraOutgoingEnergy

```
WARNING: Extra zero-probability outgoing energies found at incident energy 2.5e7 eV
WARNING: Extra zero-probability outgoing energies found at incident energy 2.8e7 eV
WARNING: Extra zero-probability outgoing energies found at incident energy 3.e7 eV
```

11. Calculated and tabulated Q values disagree.
reaction label 41: n[multiplicity:'2'] + U237 + photon (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -6107174.868743896 eV vs -6.153e6 eV!
```

12. Calculated and tabulated Q values disagree.
reaction label 43: n[multiplicity:'4'] + U235 + photon (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -17851741.9239502 eV vs -1.7823e7 eV!
```

13. Calculated and tabulated Q values disagree.
reaction label 45: n + H1 + Pa237 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -7673667.807983398 eV vs -7621002. eV!
```

14. If an outgoing energy distribution ends with more than one energy with probability=0, proper unitbase treatment is unclear. Distribution should end with exactly one P=0 point.
reaction label 46: n + H2 + Pa236 + photon / Product: n / Distribution: / energyAngular - XYs3d: (Error # 0): extraOutgoingEnergy

```
WARNING: Extra zero-probability outgoing energies found at incident energy 1.9e7 eV
WARNING: Extra zero-probability outgoing energies found at incident energy 2.3e7 eV
WARNING: Extra zero-probability outgoing energies found at incident energy 2.4e7 eV
WARNING: Extra zero-probability outgoing energies found at incident energy 2.5e7 eV
        ... plus 3 more instances of this message
```

15. Calculated and tabulated Q values disagree.
reaction label 48: H1 + (Pa238_c ->Pa238 + photon) (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2693971.376586914 eV vs -2.678e6 eV!
```

16. Calculated and tabulated Q values disagree.
reaction label 49: He4 + Th235 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 8720430.286865234 eV vs 8.7005e6 eV!
```

17. Calculated and tabulated Q values disagree.
reaction label 50: He4 + (Th235_c ->Th235 + photon) (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 8720430.286865234 eV vs 8.7e6 eV!
```

18. Calculated and tabulated Q values disagree.
reaction label 53: n + He4 + Th234 + photon (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 4304473.074127197 eV vs 4.27e6 eV!
```

19. If an outgoing energy distribution ends with more than one energy with probability=0, proper unitbase treatment is unclear. Distribution should end with exactly one P=0 point.
reaction label 54: n[multiplicity:'2'] + H1 + Pa236 + photon / Product: n / Distribution: / energyAngular - XYs3d: (Error # 0): extraOutgoingEnergy

```
WARNING: Extra zero-probability outgoing energies found at incident energy 1.9e7 eV
WARNING: Extra zero-probability outgoing energies found at incident energy 2.3e7 eV
WARNING: Extra zero-probability outgoing energies found at incident energy 2.4e7 eV
WARNING: Extra zero-probability outgoing energies found at incident energy 2.5e7 eV
        ... plus 3 more instances of this message
```

20. Calculated and tabulated Q values disagree.
reaction label 56: H1 + He4 + Ac234 + photon (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 576979.796661377 eV vs 558000.2 eV!
```

21. If an outgoing energy distribution ends with more than one energy with probability=0, proper unitbase treatment is unclear. Distribution should end with exactly one P=0 point.
reaction label 56: H1 + He4 + Ac234 + photon / Product: He4 / Distribution: / energyAngular - XYs3d: (Error # 0): extraOutgoingEnergy

```
WARNING: Extra zero-probability outgoing energies found at incident energy 2.8e7 eV
```

22. Calculated and tabulated Q values disagree.
reaction label 57: H2 + (Pa237_s ->Pa237 + photon) (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -5449340.717681885 eV vs -5.397e6 eV!
```

23. If an outgoing energy distribution ends with more than one energy with probability=0, proper unitbase treatment is unclear. Distribution should end with exactly one P=0 point.
reaction label 59: sumOfRemainingOutputChannels / Product: H1 / Distribution: / energyAngular - XYs3d: (Error # 0): extraOutgoingEnergy

```
WARNING: Extra zero-probability outgoing energies found at incident energy 2.9e7 eV
WARNING: Extra zero-probability outgoing energies found at incident energy 3.e7 eV
```

24. If an outgoing energy distribution ends with more than one energy with probability=0, proper unitbase treatment is unclear. Distribution should end with exactly one P=0 point.
reaction label 59: sumOfRemainingOutputChannels / Product: H2 / Distribution: / energyAngular - XYs3d: (Error # 0): extraOutgoingEnergy

```
WARNING: Extra zero-probability outgoing energies found at incident energy 2.9e7 eV
WARNING: Extra zero-probability outgoing energies found at incident energy 3.e7 eV
```

25. Found a negative probability
reaction label 59: sumOfRemainingOutputChannels / Product: H3 / Distribution: / energyAngular - XYs3d: (Error # 0): Negative prob.

```
WARNING: Negative probabilities encountered. Incident energy: 2.7e7 eV, worst case: -1.2491e-31
```

26. Negative multiplicity found
reaction label 59: sumOfRemainingOutputChannels / Product: Ac231 / Multiplicity: (Error # 0): Neg. mult.

```
WARNING: Encountered negative multiplicity (0.0)!
```

27. Negative multiplicity found
reaction label 59: sumOfRemainingOutputChannels / Product: Ac232 / Multiplicity: (Error # 0): Neg. mult.

```
WARNING: Encountered negative multiplicity (0.0)!
```

28. Negative multiplicity found
reaction label 59: sumOfRemainingOutputChannels / Product: Ac233 / Multiplicity: (Error # 0): Neg. mult.

```
WARNING: Encountered negative multiplicity (0.0)!
```

29. A covariance matrix was not positive semi-definite, so it has negative eigenvalues.
Section 2 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + photon [total fission]): / Form 'eval': (Error # 4): Bad evs

```
WARNING: 136 negative eigenvalues! Worst case = -2.303052e-06
```

- `njoy2012` Warnings:

1. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (0): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 11 does not give recoil za= 91235
                          one-particle recoil approx. used.
```

2. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (1): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 16 does not give recoil za=     0
                          one-particle recoil approx. used.
```

3. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (2): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 17 does not give recoil za=     0
                          one-particle recoil approx. used.
```

4. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (3): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 22 does not give recoil za= 90234
                          one-particle recoil approx. used.
```

5. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (4): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 28 does not give recoil za=     0
                          one-particle recoil approx. used.
```

6. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (5): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 32 does not give recoil za= 91236
                          one-particle recoil approx. used.
```

7. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (6): HEATR/hinit (4)

```
---message from hinit---mf6, mt 33 does not give recoil za= 91235
                        one-particle recoil approx. used.
```

8. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (7): HEATR/hinit (4)

```
---message from hinit---mf6, mt 37 does not give recoil za=     0
                        one-particle recoil approx. used.
```

9. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (8): HEATR/hinit (4)

```
---message from hinit---mf6, mt 41 does not give recoil za= 91236
                        one-particle recoil approx. used.
```

10. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (9): HEATR/hinit (4)

```
---message from hinit---mf6, mt 42 does not give recoil za= 91235
                        one-particle recoil approx. used.
```

11. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (10): HEATR/hinit (4)

```
---message from hinit---mf6, mt102 does not give recoil za= 92239
                        photon momentum recoil used.
```

12. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (11): HEATR/hinit (4)

```
---message from hinit---mf6, mt104 does not give recoil za=     0
                        one-particle recoil approx. used.
```

13. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (12): HEATR/hinit (4)

```
---message from hinit---mf6, mt105 does not give recoil za= 91236
                        one-particle recoil approx. used.
```

14. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (13): HEATR/hinit (4)

```
---message from hinit---mf6, mt112 does not give recoil za= 89234
                        one-particle recoil approx. used.
```

15. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (14): HEATR/hinit (4)

```
---message from hinit---mf6, mt849 does not give recoil za=     0
                        one-particle recoil approx. used.
```

16. There is a problem with the fission energy release.
heatr...prompt kerma (15): HEATR/nheat (3)

```
---message from nheat---changed q from   1.977860E+08 to   1.810380E+08
                        for mt  18
```

17. Coefficient mismatch of some sort
covr...process covariance data (1): COVR/matshd (2)

```
 ---message from matshd---processing of mat/mt 9237/ 18 vs. mat1/mt1 9237/ 18
                          largest coefficient=  1.00000E+00 at index  20  43
```

18. The number of coefficients is too big.
covr...process covariance data (2): COVR/matshd (3)

```
 ---message from matshd---  18 coefficients > 1
                          reset and continue.
```

- `njoy2012` Errors:

1. An angular distribution is negative
acer...monte carlo neutron and photon data (0): Neg. P(Ejμ) (b)

```
 ---message from ptleg2---negative probs found
                             8 for mt=  5 e= 1.999E+01
```

- `acelst` Warnings:

1. The incident energy grid is not monotonic for this angular distribution
0: Bad Ang. Dist.

```
 ACELST WARNING - Processing Ang.Dist.MT         2
                  E-grid non-monotonic   1.700000000E+01 1.700000000E+01
```

- `xsectplotter` Warnings:

1. Encountered runtime warning in xsectplotter or Fudge or matplotlib
(Error # 8): RuntimeWarning

```
/usr/local/lib/python2.7/site-packages/matplotlib-1.5.3-py2.7-linux-x86_64.egg/matplotlib/font_manager.py:273: U
/usr/local/lib/python2.7/site-packages/matplotlib-1.5.3-py2.7-linux-x86_64.egg/matplotlib/pyplot.py:524: Runtime
```

2. Encountered runtime warning in xsectplotter or Fudge or matplotlib
/usr/local/lib/python2.7/site-packages/matplotlib-1.5.3-py2.7-linux-x86_64.egg/matplotlib/pyplot.py:524: RuntimeWarning: More than 20 figures have been opened. Figures created through the pyplot interface (‘matplotlib.pyplot.figure‘) are retained until explicitly closed and may consume too much memory. (To control this warning, see the rcParam ‘figure.max_open_warning‘).
(Error # 0): RuntimeWarning

```
max_open_warning, RuntimeWarning)
```

- `xsectplotter` Errors:

1. Level energy in gamma data doesn't match level energy in cross section data
(Error # 2): Level mismatch (d)

```
WARNING: MT54 MF12 level energy 518100.1 differs from MF3 value 518100.2. Setting to MF3 value.
```

2. Level energy in gamma data doesn't match level energy in cross section data
(Error # 3): Level mismatch (d)

```
WARNING: MT55 MF12 level energy 680110.1 differs from MF3 value 680110.2. Setting to MF3 value.
```

3. Level energy in gamma data doesn't match level energy in cross section data
   (Error # 4): Level mismatch (d)

```
WARNING: MT56 MF12 level energy 731930.1 differs from MF3 value 731930.2. Setting to MF3 value.
```

4. Level energy in gamma data doesn't match level energy in cross section data
   (Error # 5): Level mismatch (d)

```
WARNING: MT58 MF12 level energy 826640.1 differs from MF3 value 826640.2. Setting to MF3 value.
```

5. Level energy in gamma data doesn't match level energy in cross section data
   (Error # 6): Level mismatch (d)

```
WARNING: MT61 MF12 level energy 950120.1 differs from MF3 value 950120.3. Setting to MF3 value.
```

6. Level energy in gamma data doesn't match level energy in cross section data
   (Error # 7): Level mismatch (d)

```
WARNING: MT65 MF12 level energy 997580.1 differs from MF3 value 997580.2. Setting to MF3 value.
```